SECTION 7.
HOISTING SLINGS AND FITTINGS

583–7.1 GENERAL REQUIREMENTS

583–7.1.1 NAVSEA REQUIRED SAFETY FACTORS

583–7.1.1.1 Boats and Craft Assigned to Ships. Because of the dynamic nature of boat hoisting loads and the potential for large accelerations, it is the policy of the Naval Sea Systems Command (NAVSEA) to require safety factors as follows for all boats and craft normally assigned as ships' boats to be lifted into shipborne stowages:

a. All parts shall be designed to a safety factor of at least six, based on the ultimate strength of the material.

b. All terminating sling shackles shall be Type IVA, class 3 safety anchor shackles, in accordance with RR–C–271D. All open sockets terminating a sling leg shall have the pin replaced with a bolt, nut and cotter pin, similar to a safety anchor shackle pin. Pin material shall be in accordance with RR–C–550D.

c. Attachment points shall be on strength members of the boat.

d. Design of all slings and attachments shall be approved by NAVSEA before fabrication.

583–7.1.1.2 Boats and Craft Assigned to Shore Stations. For boats and craft not designed to be routinely hoisted aboard ship, such as LCU's, and those permanently assigned to shore stations, the factors of safety shall be at least five. Such hoisting gear is considered to be logistical only. This category of boats includes extensively reconfigured craft where the specialized nature of the craft, as modified, precludes its being returned to service requiring shipboard hoisting (such as LCM's to diving tenders, work boats, and so forth) as well as other specifically designed craft. In addition:

a. Attachment points shall be on strength members of the boat.

b. All terminating sling shackles shall be Type IVA, class 3 safety anchor shackles, in accordance with RR–C–271D. All open sockets terminating a sling leg shall have the pin replaced with a bolt, nut and cotter pin, similar to a safety anchor shackle pin. Pin material shall be in accordance with RR–C–550D.

c. Design of all slings and attachments shall be approved by NAVSEA before fabrication.

583–7.1.2 HOISTING CONDITION WEIGHTS. The design and testing of all components related to hoisting are based on the design hoisting weight of the boat. The design hoisting weight generally includes hull, machinery (wet), full fuel, full outfit (boat hook, fire extinguishers, etc.), crew, and a growth margin. The design hoisting weight is specified on the hoisting test data plate generally located near the coxswain's station. General information on design hoisting weights is given in Table 583–3–1. Only the weight indicated on the hoisting test data plate shall be used for the baseline weight for determining the overload weight for tests. Should the hoisting test data label plate be missing or illegible, the applicable "Hoisting Arrangement and Details" drawing shall be consulted to determine the correct design hoisting weight.

583–7.1.3 GALVANIZING OF PARTS. Ferrous (i.e., ordinary steel) chain, shackles, sockets, links, rings, equalizing thimbles attached to wire rope, and chains shall be galvanized.

583–7.1.4 IMPROVISING OF SLINGS. Since all ships' boats are furnished with slings, improvising of slings is not authorized except at naval shipyards and repair activities by qualified riggers.

583–7.2 MANUFACTURE OF HOISTING SLINGS, BAILS, AND FITTINGS

583–7.2.1 Any repair activity that has the capability of testing slings, bails, hoisting shackles, rods, pins, chain links, and rings is authorized to manufacture such equipment according to applicable drawings, EXCEPT for

Kevlar slings which shall not be obtained from any source other than those given on the applicable drawing. Manufacture shall not be accomplished if the equipment is available as a standard stock item. Testing, inspections, marking, and record keeping shall be accomplished in accordance with the further provisions of this section.

CAUTION

Kevlar rope slings require specialized manufacturing process controls to maintain safety standards. Kevlar slings shall not be obtained from any source other than those designated on the approved drawings.

583–7.3 INSPECTIONS

583–7.3.1 GENERAL. All slings, bails, and hoisting fittings shall be visually inspected for proper assembly and condition at least once a month or before each lift and they shall not be used if signs of deterioration are noted. Sockets and shackles shall be checked to ensure the intended pins are used. Before conducting any hoisting test, a careful inspection shall be made of all hoisting fittings, slings, or bails to determine whether the parts are in proper condition. After any load test, inspect all components for signs of permanent deformation, cracking of any of the components or supporting boat structure, elongated holes, or bent shackle or socket pins.

583–7.3.2 WIRE ROPE SLINGS. Wire rope slings shall be inspected for broken or damaged strands, crimps, kinks, cuts, and corrosion. Inspection and removal shall be in accordance with **NSTM Chapter 613**.

583–7.3.3 WEBBING SLINGS. Webbing slings shall be inspected for abrasion, tears, cuts, snags, punctures and fraying of the webbing and stitching. Slings exhibiting any of the following shall be removed from service:

a. Acid or caustic burns

b. Melting or charring of any part of the sling

c. Snags, punctures, tears or cuts

d. Broken or worn stitches

e. Distortion of fittings

f. Wear or elongation exceeding amount recommended by manufacturer

g. Other apparent defects that cause doubt as to the strength of the sling

h. Loading of the sling beyond its rated capacity

i. Exposure of Red Guard warning yarn

j. Paint present on any part of webbing

Since new webbing exhibits different stretch characteristics from older webbing, the entire sling should be disposed of in lieu of replacing only the bad sling legs. Tying knots in webbing slings will dramatically reduce the strength of the webbing and is not allowed. Paint will also reduce the strength of the webbing and should not be used for stencilling.

583–7.3.4 KEVLAR SLINGS. Kevlar slings should be inspected for cuts, abrasions, snagging and badly worn areas in the outer jacket. Extensive damage to outer jacket could indicate damage to inner load bearing core. Slings exhibiting any of the following shall be removed from service:

a. Core has been cut or damaged

b. Slings have been exposed to excessive heat (greater than 150 degrees Fahrenheit)

c. Slings shave been loaded beyond their rated capacity

d. Distortion of fittings

e. Other apparent defects that cause doubt as to the strength of the sling

f. Abrasions or cuts on the jacket which prevent the jacket from providing sufficient protection for the core.

Since new rope exhibits different stretch characteristics from older rope entire sling should be disposed of in lieu of replacing only the bad sling legs. Typing knots in Kevlar sling will dramatically reduce the strength of the sling and is not allowed.

583–7.3.5 RIGID BAILS. Rigid bails shall be inspected for cracks, deformation, corrosion, crimping, and loose fasteners. Rigid bails that contain cracks, deformation, corrosion, or crimping shall be taken out of service. Loose fasteners and similar discrepancies shall be corrected before the bail is placed into service.

583–7.4 TESTING

583–7.4.1 HOISTING SLING LOAD TESTS. Job orders or contracts for manufacture of boat slings shall require that the sling and associated hardware not permanently attached to the boat be tested as indicated under the heading of "Test Procedures" on the respective "Hoisting Arrangement and Details" drawings The number for this drawing can usually be found on the hoisting label plate located near the coxswain's station or in the Boat Information Book. Test loads are intended to be 100 percent in excess of the design working load of the part. Sling tests shall be performed in load testing equipment designed for that purpose. One–hundred percent overload tests are never performed in the boat. Unless specifications call for testing slings in the same configuration as used, one or more legs may be tested at a time using the straight line pull method at 100 percent overload based on the design load for each leg.

583–7.4.1.1 Wire Rope Sling Load Test Periodicity. During normal repair and overhaul availabilities of a ship, all wire rope slings that have not been tested in the preceding 18 months, except those shipped with new boats, shall be retested and marked before issue. Hoisting slings for boats assigned to shore stations shall be subjected to a 100 percent overload test every 24 months.

583–7.4.1.2 Webbing Sling Load Test and Replacement Periodicity. Operators of boats provided with webbing slings shall refer to the applicable Maintenance Index Page (MIP) for the periodicity of testing and replacement.

583–7.4.1.3 Kevlar Sling Load Test and Replacement Periodicity. Operators of boats provided with Kevlar slings shall refer to the applicable Maintenance Index Page (MIP) for the periodicity of testing and replacement.

583–7.4.1.4 Retesting of New Slings. The time interval after which the first periodic testing is required for new slings received from stock or shipped with new boats is taken from the date the slings were placed in service that will be indicated on the in–service tag. If no in–service tag is present the retesting period is taken from the date on the certification test markings. If no test markings are present the sling certification shall be assumed to be out of date and the slings shall be retested.

583–7.4.2 RIGID BAIL LOAD TESTS. Rigid bails are similar to other permanently installed hoisting fittings in that they are less prone to wear and damage than wire rope, webbing or Kevlar slings. Rigid bails shall be load–tested upon completion of a new boat or after any repairs to the bail. The rigid bail shall be tested by weighting the boat 50 percent in excess of its normal design hoisting weight and lifting it, using the bail, just clear of the water or shop floor for 10 minutes. When conducting the 50 percent overload test, it is absolutely necessary that the correct weight be used. The design hoisting weight is specified on the hoisting test data plate. Only the weight indicated on the hoisting data plate shall be used for the baseline weight for the 50 percent overload test. The added weight shall be distributed, one half forward and one half aft, as near the hoisting fittings as possible, care being taken not to place any significant added weight amidships.

583–7.4.3 HOISTING FITTING LOAD TESTS. Hoisting fittings permanently attached to the boat shall be load–tested upon completion of a new boat or after extensive repairs have been made to a boat in service. The boat's lifting slings or bail shall be inspected prior to conducting this test to ensure their adequacy for the test load and to verify that they have been load tested within the required certification period. The boat's hoisting fittings shall be tested by weighting the boat 50 percent in excess of its normal design hoisting weight and lifting it by its hoisting slings or bail just clear of the water or shop floor for 10 minutes. For boats that have fittings for both sling lifting and davit lifting, the overload test shall be conducted for both configurations. When conducting the 50 percent overload test, it is absolutely necessary that the correct weight be used. The design hoisting weight indicated on the hoisting data plate shall be used for the baseline weight for the 50 percent overload test. The added weight shall be distributed, one half forward and one half aft, as near the hoisting fittings as possible, care being taken not to place any significant added weight amidship.

583–7.4.4 FIT TESTS. Before finally accepting newly issued, repaired, or altered hoisting slings or bails, ships shall test them for fit by hoisting the boat using the method that normally will be used in service. The boat shall be lifted by its slings and suspended for at least 10 minutes, just clear of the water, deck, or stowage, to minimize damage in case of failure.

583–7.5 MARKING

583–7.5.1 GENERAL. Slings are not designed to be interchangeable between different boat types and marks. Due to differences in the details of the design, slings for a given boat are not always suitable for use on all other boats of the same type. For these reasons, identification markings must be placed on all slings. Slings shall not be issued without test markings attached. If unmarked slings are found in stock or if slings or bails have been repaired they shall be retested and marked. Naval shipyards receiving boats with hoisting slings which are uncertified may use these slings before recertification testing to hoist the boat within the shipyard if the following steps are adhered to:

a. The sling is verified as having previously been tested to the correct load from the test bands installed on the sling.

b. The wire rope or webbing and fittings are visually inspected for damage, wear, corrosion, or other defects.

c. If the above inspections determine that the sling is satisfactory, the boat should be secured to the sling and hoisted just clear of all other support and held for a minimum period of 10 minutes by the sling. The sling is then reinspected for evidence of failure or permanent deformation.

Kevlar slings shall be marked in accordance with the MIP.

583–7.5.2 WIRE ROPE SLINGS. When slings are manufactured and after the load test has been satisfactorily completed, a copper or stainless steel band shall be fitted to each sling leg, identifying the leg (for example aft–port), indicating the test has been made and giving the name of the certifying activity, the contract number (if applicable), the registry number of the boat for which manufactured (for example, 26MW9001), the government inspecting office (if applicable), and the date of the test. If the sling is being returned to service after periodic testing, the bands shall be marked with the test date and name of the testing activity. If, for any reason, slings are assigned to another boat of like design (type and mark), the boat number on the band shall be changed accordingly.

583–7.5.3 WEBBING SLINGS. When slings are manufactured and after the load test has been satisfactorily completed, an etched leather tag shall be sewn to each sling leg, identifying the leg (for example aft–port), indicating the test has been made and giving the name of the certifying activity, the contract number (if applicable), the registry number of the boat for which manufactured (for example, 24RB9101), the government inspecting office (if applicable), and the date of the test. If the sling is being returned to service after periodic testing, the tags shall be marked with the test date and name of the testing activity. If, for any reason, slings are assigned to another boat of like design (type and mark), the boat number on the tag shall be changed accordingly.

583–7.5.4 RIGID BAILS. When bails are manufactured or repaired and after the load test has been satisfactorily completed, a copper or stainless steel hoisting test data plate shall be secured to the bail with stainless steel bands. The hoisting test data place shall give the design working load of the bail (i.e. the design hoisting weight), the weight of the boat for the 50 percent overload test, the date of the test, and the place tested.

583–7.5.5 LIFTING FITTINGS. New boats shall be delivered with a hoisting test data label plate which identifies the design hoisting weight of the boat, the weight of the boat for the 50 percent overload test, the NAVSEA drawing number for the "Hoisting Arrangement and Details" drawing, the date of the test, and the place tested. In addition, spaces shall be provided for stamping the date and place tested for subsequent overload tests on the fittings permanently attached to the boat. Repair activities shall update the hoisting test data label plate by stamping or engraving the data and activity certifying subsequent overload tests of the boat's lifting fittings. If there is no hoisting test data label plate, a new label plate shall be fabricated in accordance with the applicable "Hoisting Arrangement and Details" drawing and installed in the vicinity of the coxswain's station.

583–7.5.6 IN–SERVICE TAGS. Slings shipped with new boats or received from stock should be marked by the receiving activity to indicate the date the slings are actually put into service. This is done to avoid unnecessary retesting when new slings, which were load tested during manufacture, have been kept in storage prior to issue. The date placed in service should be engraved or punched on the in–service tag provided with the sling. If no tag is provided, an in–service tag may be fabricated by the receiving activity and attached to the lifting ring in a manner that does not interfere with any of the working surfaces of the sling. The in–service tag should indicate the date placed in service and the activity placing the sling in service. The original load test tag shall not be removed. The in–service date is the date the sling is placed on a boat aboard ship or begins use by a shore facility. For new ship construction service begins when the slings are first used for handling the boat after delivery to the shipbuilder.

583–7.6 RECORDS OF INSPECTION AND TESTS

583–7.6.1 CRAFT LOG. Boat operators or the ship's force concerned shall maintain a record of inspections and test of hoisting fittings, rigid bails, shackles, rings, and slings. Records shall show the date, and shall describe the condition of the parts inspected and tested. These records shall be kept as a part of the normal craft log.

583–7.6.2 REPAIR ACTIVITIES' RECORD OF INSPECTIONS AND TESTS. Repair activities shall keep a record of inspections and tests of hoisting fittings, rigid bails, shackles, rings, and slings. Records shall show the date and boat registry number, and shall describe the condition of the parts inspected and tested. Results of these inspections and tests shall be entered in the material history of the boat by the ship or other cognizant activity concerned.

583–7.7 SIDE GUYS

583–7.7.1 GENERAL. Side guys (steadying lines for slings) are required on certain boats where the hoisting fittings are below the center of gravity. Their purpose is to prevent the boat from rolling to one side while being hoisted. Wire rope shall not be used. These guys are not intended to take any part of the weight of the boat in lifting; therefore, no separate load test is required. However, side guys shall be properly installed prior to conducting overload tests on the boat's hoisting fittings.

583–7.7.2 RIGGING FIBER LINE SIDE GUYS. The following procedure should be used in rigging side guys:

a. Secure a fiber guy to each padeye or cleat intended for its use.

b. While the boat is onboard ship, take a strain on the slings, adjust length of side guys so that they will not take the hoisting strain.

c. Secure side guy with a rolling hitch backed up by a half hitch and marry the better end of each side guy to the standing part with a length of marlin.

In hoisting, each side guy should be secured to its padeye before a strain is taken on the slings. The foregoing is to be done for slings assigned to each boat. The position of the rolling hitch must be adjusted periodically to compensate for any stretch of the fiber lines used as side guys.